

WHAT IS CLAIMED

1) A composition of matter comprising particles which contain choline chloride to be administered in a rumen-protected and post- ruminally effective form, each particle comprising a core which contains choline chloride and a protective coating surrounding the core and protecting choline chloride by ruminal activity while allowing its release into the post-rumen portion of the digestive tract of a ruminant, wherein the core mainly consists of choline chloride in the form of a dry, crystalline powder and, in combination, the protective coating surrounding the core comprises an outer, continuous layer mainly consisting of carnauba wax and an inner, continuous layer consisting of a hydrophobic substance.

2) A composition of matter as claimed in claim 1, wherein the dry, crystalline powder of choline chloride is composed by micronized crystals having a predetermined distribution of particle size.

3) A composition of matter as claimed in claim 2, wherein the average particle size of the micronized crystals ranges from 100 micrometers to 300 micrometers.

4) A composition of matter as claimed in claim 2, wherein the average particle size of the micronized crystals is 200 micrometers.

5) A composition of matter as claimed in claim 1, wherein the amount of dry, crystalline powder of choline chloride in the core ranges from 80%

to 95% by weight of the core.

6) A composition of matter as claimed in claim 1, wherein the amount of dry, crystalline powder of choline chloride in the core ranges from 85% to 90% by weight of the core.

7) A composition of matter as claimed in claim 1, wherein the core comprises a predetermined amount of additional substances.

8) A composition of matter as claimed in claim 7, wherein the additional substances comprise a flow modifier.

9) A composition of matter as claimed in claim 8, wherein the flow modifier comprises one or more compounds chosen in the family of silicates.

10) A composition of matter as claimed in claim 9, wherein the flow modifier comprises one or more compounds chosen in the group of alluminosilicates.

11) A composition of matter as claimed in claim 8, wherein the flow modifier comprises one or more compounds chosen in the group consisting of zeolites, silica, perlite.

12) A composition of matter as claimed in claim 8, wherein the amount

of flow modifier in the core ranges from 3% to 8% by weight of the core.

13) A composition of matter as claimed in claim 8, wherein the amount of flow modifier in the core is equal to 3% by weight of the core.

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14) A composition of matter as claimed in claim 8, wherein the amount of flow modifier in the core is equal to 8% by weight of the core.

15) A composition of matter as claimed in claim 7, wherein the additional substances comprise a predetermined amount of a binder acting as a moisture barrier.

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16) A composition of matter as claimed in claim 15, wherein the binder acting as a moisture barrier comprises one or more compounds chosen in the family of stearates.

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17) A composition of matter as claimed in claim 16, wherein the binder acting as a moisture barrier comprises one or more compounds chosen among zinc stearate, magnesium stearate and calcium stearate.

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18) A composition of matter as claimed in claim 15, wherein the amount of binder acting as a moisture barrier in the core is equal to 7% by weight of the core.

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19) A composition of matter as claimed in claim 7, wherein the

additional substances comprise a flow modifier and a predetermined amount of a binder acting as a moisture barrier.

20) A composition of matter as claimed in claim 19, wherein: the core contains 90% by its weight of dry crystalline choline chloride in the form of micronized crystals, the remaining 10% by weight of the core being composed by a flow modifier consisting of silica in an amount of 3% by weight of the core and by a binder acting as a moisture barrier consisting of calcium stearate in an amount of 7% by weight; the core represents 39.0% by weight of the final particle; the whole protective coating represents 61.0% by weight of the final particle; the inner, continuous layer is composed solely by hydrogenated soybean oil as hydrophobic substance; the outer, continuous layer is completely composed by carnauba wax; the inner layer represents 60% by weight of the protective coating material and the 36.6% by weight of the final particle; the outer layer represents 40% by weight of the protective coating material, and 24.4% by weight of the final particle; the final particle having a particle size ranging from 400 micrometers to 1200 micrometers.

21) A composition of matter as claimed in claim 19, wherein: the core contains 90% by its weight of dry crystalline choline chloride in the form of micronized crystals, the remaining 10% by weight of the core being composed by a flow modifier consisting of silica in an amount of 3% by weight of the core and by a binder acting as a moisture barrier consisting of calcium stearate in an amount of 7% by weight of the core; the core

represents 44.2% by weight of the final particle; the whole protective coating represents 55.8% by weight of the final particle; the inner, continuous layer is composed solely by hydrogenated soybean oil as hydrophobic substance; the outer, continuous layer is composed solely by carnauba wax ; the inner layer represents 55% by weight of the protective coating and the 30.7% by weight of the final particle; the outer layer represents 45% by weight of the protective coating, and 25.1% by weight of the final particle; the final particle in the composition of matter having a particle size ranging from 200 micrometers to 1000 micrometers.

22) A composition of matter as claimed in claim 7, wherein the amount of additional substances in the core is lower than or at most equal to 20% by weight of the core.

23) A composition of matter as claimed in claim 7, wherein the amount of additional substances in the core is equal to 15% by weight of the core.

24) A composition of matter as claimed in claim 7, wherein the amount of additional substances in the core ranges from 1% to 10% by weight of the core.

25) A composition of matter as claimed in claim 7, wherein the amount of additional substances in the core ranges from 2% to 8% by weight of the core.

26) A composition of matter as claimed in claim 7, wherein the amount of additional substances in the core is 7% by weight of the core.

5 27) A composition of matter as claimed in claim 1, wherein the core has a weight ranging from 30% to 70 % by weight of the whole particle.

28) A composition of matter as claimed in claim 1, wherein the core has a weight ranging from 40% to 50 % by weight of the whole particle.

10 29) A composition of matter as claimed in claim 1, wherein the amount of carnauba wax in the outer layer ranges from 80% to 100% by weight of the outer layer itself.

15 30) A composition of matter as claimed in claim 1, wherein the amount of carnauba wax in the outer layer ranges from 90% to 95% by weight of the outer layer itself.

20 31) A composition of matter as claimed in claim 1, wherein the outer layer further comprises a predetermined amount of a rigidity controlling agent mixed with carnauba wax to control the rigidity of the outer layer.

32) A composition of matter as claimed in claim 31, wherein the predetermined amount of the rigidity controlling agent is lower than or at most equal to 20% by weight of the outer layer.

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33) A composition of matter as claimed in claim 31, wherein the predetermined amount of the rigidity controlling agent ranges from 5% to 10% by weight of the outer layer.

5 34) A composition of matter as claimed in claim 31, wherein the rigidity controlling agent is a plasticizer.

35) A composition of matter as claimed in claim 31, wherein the rigidity controlling agent comprises one or more lipids.

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36) A composition of matter as claimed in claim 35 wherein the one or more lipids are selected from the family of vegetable oils.

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37) A composition of matter as claimed in claim 35 wherein the one or more lipids are selected from the group consisting of palm oil and soybean oil.

38) A composition of matter as claimed in claim 35 wherein at least one of the one or more lipids is a hydrogenated vegetable oil.

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39) A composition of matter as claimed in claim 31, wherein the core comprises a predetermined amount of additional substances.

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40) A composition of matter as claimed in claim 39, wherein the additional substances comprise a flow modifier.

41) A composition of matter as claimed in claim 39, wherein the additional substances comprise a predetermined amount of a binder acting as a moisture barrier.

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42) A composition of matter as claimed in claim 39, wherein the additional substances comprise a flow modifier and a predetermined amount of a binder acting as a moisture barrier.

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43) A composition of matter as claimed in claim 42, wherein: the core contains 90% by its weight of dry crystalline choline chloride in the form of micronized crystals, the remaining 10% by weight of the core being composed by a flow modifier constituted by silica in an amount of 3% by weight of the core and by a binder acting as a moisture barrier constituted by magnesium stearate in an amount of 7% by weight of the core; the core represents 45.50% by weight of the final particle; the whole protective coating represents 54.50% by weight of the final particle; the inner, continuous layer is composed solely by hydrogenated palm oil as hydrophobic substance; the outer, continuous layer is composed by carnauba wax in an amount of 90% by weight of the outer layer and by soybean oil as a rigidity controlling agent in an amount of 10% by weight of the outer layer; the inner layer represents 70% by weight of the protective coating and the 38.15% of the final particle; the outer layer represents 30% by weight of the protective coating, and 16.35% by weight of the final particle; the final particle in the composition of matter having a particle size

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ranging from 300 micrometers to 1200 micrometers.

44) A composition of matter as claimed in claim 42, wherein: the core contains 85% by its weight of dry crystalline choline chloride in the form of micronized crystals, the remaining 15% by weight of the core being composed by a flow modifier comprising perlite and silica, respectively in an amount of 3% and 5% by weight of the core, and by a binder acting as a moisture barrier constituted by calcium stearate in an amount of 7% by weight of the core; the core represents 47.2% by weight of the final particle; the whole protective coating represents 52.8% by weight of the final particle; the inner, continuous layer is composed solely by hydrogenated soybean oil as hydrophobic substance; the outer, continuous layer is composed by carnauba wax in an amount of 90% by weight of the outer layer and by palm oil as a rigidity controlling agent in an amount of 10% by weight of the outer layer; the inner layer represents 55% by weight of the protective coating and the 29.0% of the final particle; the outer layer represents 45% by weight of the protective coating, and 23.8% by weight of the final particle; the final particles in the composition of matter having a particle size ranging from 400 micrometers to 1200 micrometers.

45) A composition of matter as claimed in claim 42, wherein: the core contains 85% by its weight of dry crystalline choline chloride in the form of micronized crystals, the remaining 15% by weight of the core being composed by a flow modifier comprising perlite and silica, respectively in an amount of 3% and 5% by weight of the core, and by a binder acting as a

moisture barrier consisting of calcium stearate in an amount of 7% by weight of the core; the core represents 47.75% by weight of the final particle; The whole protective coating represents 52.25% by weight of the final particle; the inner, continuous layer is composed solely by hydrogenated soybean oil as hydrophobic substance; the outer, continuous layer is composed by carnauba wax in an amount of 95% by weight of the outer layer and by palm oil in an amount of 5% by weight of the outer layer; the inner layer represents 50% by weight of the protective coating and the 26.125% of the final particle; the outer layer represents 50% by weight of the protective coating, and 26.125% by weight of the final particle; the final particles in the composition of matter having a particle size ranging from 400 micrometers to 1200 micrometers.

46) A composition of matter as claimed in claim 1, wherein the outer continuous layer constitutes a percentage by weight of the protective coating which ranges from 30% to 60%.

47) A composition of matter as claimed in claim 1, wherein the outer continuous layer constitutes a percentage by weight of the protective coating which ranges from 45% to 55%.

48) A composition of matter as claimed in claim 1, wherein the inner, continuous layer constitutes a percentage by weight of the protective coating which ranges from 40% to 70%.

49) A composition of matter as claimed in claim 1, wherein the inner continuous layer constitutes a percentage by weight of the protective coating which ranges from 45% to 55%.

5 50) A composition of matter as claimed in claim 1, wherein the hydrophobic substance comprises one or more lipids.

51) A composition of matter as claimed in claim 50 wherein the one or more lipids are selected from the family of vegetable oils.

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52) A composition of matter as claimed in claim 50 wherein the one or more lipids are selected from the group consisting of palm oil and soybean oil.

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53) A composition of matter as claimed in claim 50 wherein at least one of the one or more lipids is a hydrogenated vegetable oil.

54) A composition of matter as claimed in claim 1, wherein the hydrophobic substance comprises stearic acid.

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55) A composition of matter as claimed in claim 1, wherein the protective coating constitutes a percentage by weight of the whole particle which ranges from 30% to 70%.

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56) A composition of matter as claimed in claim 1, wherein the

protective coating constitutes a percentage by weight of the whole particle which ranges from 50% to 60%.

5 57) A feed pellet containing a composition of matter as claimed in anyone of the previous claims from 1 to 56.

58) A premix for feed containing a composition of matter as claimed in anyone of the claims from 1 to 56.

10 59) Mash feed in unpelletted form, containing a composition of matter as claimed in anyone of the claims from 1 to 56.